Claims

[c1]   A method of operating an Internet Protocol (IP) network comprising a plurality of routers, each router further comprising a plurality of interfaces, the method comprising the steps of:

connecting a spare interface on a first router in the IP network to a re-configurable transport network which provides connectivity to a spare interface on a second router in the IP network;

upon detection of a pre-designated condition in the IP network, switching traffic designated for a primary interface at the first router to the spare interface at the first router in the IP network, thereby causing the traffic to flow across spare capacity on the re-configurable transport network between the spare interface on the first router and the spare interface on the second router in the IP network.

[c2]   The method of claim 1 wherein the pre-designated condition is a failure in the primary interface at the first router in the IP network.

[c3]   The method of claim 2 wherein the primary interface provided connectivity to the re-configurable transport

network before failure and wherein the spare interface provides 1:N interface protection.

[c4] The method of claim 2 wherein the primary interface provided connectivity over a direct point-to-point link and wherein the spare interface provides dynamic establishment of a new IP link in response to the failure.

[c5] The method of claim 1 wherein the pre-designated condition is a surge in traffic across the primary interface at the first router in the IP network.

[c6] The method of claim 1 wherein the re-configurable transport network comprises a plurality of optical cross-connects.

[c7] A device-readable medium storing program instructions for performing a method of operating a router in an Internet Protocol (IP) network, the router further comprising a routing table and a plurality of interfaces including a spare interface providing connectivity through a re-configurable transport network to a spare interface on a second router in the IP network, the method comprising the steps of:

receiving a signal indicating a pre-designated condition in the IP network;

reconfiguring the routing table in the router so as to

switch traffic designated for a primary interface at the router to the spare interface at the router, thereby causing the traffic to flow across spare capacity on the reconfigurable transport network between the spare interface on the router and the spare interface on the second router in the IP network.

[c8] The device-readable medium of claim 7 wherein the predesignated condition is a failure in the primary interface at the first router in the IP network.

[c9] The device-readable medium of claim 8 wherein the primary interface provided connectivity to the reconfigurable transport network before failure and wherein the spare interface provides 1:N interface protection.

[c10] The device-readable medium of claim 8 wherein the primary interface provided connectivity over a direct point-to-point link and wherein the spare interface provides dynamic establishment of a new IP link in response to the failure.

[c11] The device-readable medium of claim 7 wherein the predesignated condition is a surge in traffic across the primary interface at the first router in the IP network.

[c12] An Internet Protocol (IP) router comprising:

a plurality of interfaces including at least one primary interface and a spare interface providing connectivity through a re-configurable transport network to a spare interface on a second router in an IP network;

a routing table that, upon receipt at the router of a signal indicating a pre-designated condition in the IP network, is reconfigured so as to switch traffic designated for a primary interface at the router to the spare interface at the router, thereby causing the traffic to flow across spare capacity on the re-configurable transport network between the spare interface on the router and the spare interface on the second router in the IP network.

[c13] The router of claim 12 wherein the pre-designated condition is a failure in the primary interface at the first router in the IP network.

[c14] The router of claim 13 wherein the primary interface provided connectivity to the re-configurable transport network before failure and wherein the spare interface provides 1:N interface protection.

[c15] The router of claim 13 wherein the primary interface provided connectivity over a direct point-to-point link and wherein the spare interface provides dynamic establishment of a new IP link in response to the failure.

[c16] The device-readable medium of claim 12 wherein the pre-designated condition is a surge in traffic across the primary interface at the first router in the IP network.